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(54) **SPEED SENSING CIRCUIT FOR UNDERWATER PROJECTILES**

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(51) **Int. Cl.**⁷ **G01P 3/66; G01P 3/80**

(52) **U.S. Cl.** **324/178; 73/167**

(58) **Field of Search** **324/178, 179,
324/180; 73/167**

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,493,856 A * 2/1970 Wilson 324/180

* cited by examiner

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(57) **ABSTRACT**

A system for sensing projectile velocity and position having a plurality of support members positioned in a path of said projectile. Each support member has an aperture with a resistive trace supported in the aperture. The resistive trace can be separated by the projectile's passage. A sensing circuit is joined to each resistive trace and provides a signal indicating separation of the resistive trace. This signal is provided to a logic circuit which provides a single signal indicating separation of each said resistive trace. A data acquisition system provides an output indicating said projectile velocity and position with respect to time.

12 Claims, 4 Drawing Sheets

